

ABSTRACT

A premium "fuel-grade" petroleum coke is produced by modifying petroleum coking technology. Coking process parameters are controlled to consistently produce petroleum coke within a predetermined range for volatile combustible material (VCM) content. The invention includes a process of producing a coke fuel, the method comprising steps: (a) obtaining a coke precursor material derived from crude oil and having a volatile organic component; and (b) subjecting the coke precursor material to a thermal cracking process for sufficient time and at sufficient temperature and under sufficient pressure so as to produce a coke product having volatile combustible materials (VCMs) present in an amount in the range of from about 13% to about 50% by weight. Most preferably, the volatile combustible materials in the coke product typically may be in the range of from about 15% to about 30% by weight. The present invention also provides methods for (1) altering the coke crystalline structure, (2) improving the quality of the coke VCM, and (3) reducing the concentration of coke contaminants. Fuels made from the inventive coke product and methods of producing energy through the combustion of such fuels are also included. Finally, novel environmental control techniques are developed to take optimal advantage of the unique characteristics of this upgraded petroleum coke.